

Remarks

Applicant requests reconsideration of the application in view of the remarks below.

Advisory Action

The Advisory action dated June 11, 2009, states that the evidence filed on June 2, 2009, was of such poor quality that it was not considered by the examiner. Filed herewith as Exhibits A and B are better quality copies of the evidence submitted on June 2, 2009. Applicant respectfully requests consideration of the submitted evidence. Applicant is willing to email the Examiner copies of Exhibits A and B if reproduction of Exhibits A and B at the Patent Office degrades the readability of these documents. The last page of Exhibit B is an enlargement of the first paragraph of page 171 of this document, which is relevant to the claim construction of the claim term “self-lubricating liner.”

In the response filed June 2, 2009, Applicant also referred to U.S. Patent No. 7,320,549 as evidence of how one skilled in the art would interpret the claim term “self-lubricating liner.” The Advisory action is silent as to evidentiary weight given to this document. Applicant respectfully submits that U.S. Patent No. 7,320,549 provides sufficient support for the claim construction proposed by Applicant, even without the documents shown in Exhibits A and B. Absent contrary evidence that supports a broader construction for the term “self-lubricating liner,” the Office should apply Applicant’s claim construction when examining the claims of the present application.

The remarks below are the same as provided in the response filed June 2, 2009 and are repeated here for convenience.

Rejection under 35 U.S.C. § 103(a)

The Office action rejects claims 1, 2, 6-11, 13, 16, 18, and 19 under 35 U.S.C. § 103(a) over U.S. Patent No. 5,660,482 (Newley) in view of GB Patent No. 2,170,279 (Harrison). This rejection is respectfully traversed for the reasons set forth below.

Claim 1 concerns a self-lubricating bearing having a self-lubricating liner and a counterface surface in close sliding contact therewith, the counterface surface having a surface finish of less than 20 nm and a hardness of less than in the region of 1000 VPN. The action alleges that the chromium plated inner surface 2 of Newley’s bearing constitutes a self-

lubricating liner. The action states that because the chromium plating is provided “to avoid galling between the cooperating surfaces,” the chromium plating is therefore a self-lubricating liner under the broadest reasonable interpretation of the term. Applicant disagrees.

A “self-lubricating” bearing liner is a term of art that must be construed as would be understood by one skilled in the art. As was pointed out by Applicant’s representative in the telephone interview, for a material to be “self-lubricating,” it must be capable of providing a substance which forms a film of lubricant between two bearing surfaces. One example of a self-lubricating material disclosed in the present application is PTFE. In use, some of the PTFE material is removed from the liner, due to abrasive wear, and deposited on the opposing bearing surface to form an additional film of PTFE material thereon. Subsequent wear is thus much decreased and is known as “adhesive wear.”

Attached hereto as Exhibit A is a description of self-lubricating bearings from Kempe’s Engineers Year-Book (1998), which describes several examples of self-lubricating bearings. As described in this reference, metal bearing liners, such as bronze liners, must be combined with a lubricant, such as by impregnating the bronze with filled PTFE. Also, reference can be made to the Background section of U.S. Patent No. 7,320,549 for a brief description of conventional bearings (which require a lubricant such as grease) and self-lubricating bearings (in which a layer of lubricant is provided by the lining material itself). Examples of convention materials from which self-lubricating bearings are made include “copper alloys such as bronze, aluminum bronze, manganese bronze and hardened steel and steel-backed copper alloy structures.” To impart lubricating properties to the bearing, the surface of the metal is provided with pockets or cavities into which a lubricating component is held. In use, a thin layer of the lubricating material is distributed from the pockets or cavities between the bearing surfaces. See col. 1, lines 54-63 of the ‘549 patent.

Also attached as Exhibit B is the entry for the term “Lubrication” from The New Encyclopedia Britannica, 15th Edition, which describes several types of solid lubricants. As described in this reference, soft metals, such as lead, tin and indium, placed on a hard substrate can act as effective lubricants. See page 171.

By comparison, chrome itself (as used in Newley) is not a self-lubricating material. Instead, chrome is a very hard substance and if chrome particles were to break free from either surface, they would scratch and destroy the bearing surfaces, rather than form a lubricating layer

as required of a self-lubricating bearing. As is well known in the art, a chrome bearing would require the provision and periodic replenishment of grease, oil and/or dry film lubricant, because chrome is not self-lubricating.

In short, the claim term “self-lubricating liner” in claim 1 must be given its meaning within the art; that is, a liner that creates a layer of lubricating material between the two bearing surfaces. Because the chrome plating of Newley is not a self-lubricating liner, Newley does not meet the limitations of claim 1. Harrison also does not teach or suggest a self-lubricating liner. For at least these reasons, claim 1 is not obvious over the combination of Newley and Harrison, and this rejection should be withdrawn.

Claims 2 and 6-8 depend from claim 1 and are thus nonobvious over Newley and Harrison for at least the same reasons claim 1 is nonobvious, and because each dependent claim recites a distinctly patentable combination of features.

Independent claim 9 concerns a method of constructing a self-lubricating bearing comprising providing a self-lubricating liner in sliding contact with a counterface surface having a surface finish of less than 20 nm and a hardness of less than 1000 VPN. Neither Newley nor Harrison teaches or suggests a bearing having a self-lubricating liner. Hence, claim 9 is not rendered obvious by Newley or Harrison (alone or in combination), and the rejection of claim 9 should be withdrawn.

Claims 10, 13, 16 depend from claim 9 and are nonobvious over Newley and Harrison for at least the same reasons claim 9 is nonobvious, and because each dependent claim recites a distinctly patentable combination of features.

Independent claim 11 concerns a method of operating a self-lubricating bearing having a self-lubricating liner in sliding contact with a counterface surface having a surface finish of less than 20 nm and a hardness of less than 1000 VPN. Neither Newley nor Harrison teaches or suggests a bearing having a self-lubricating liner. Thus, claim 11 cannot be obvious over Newley and Harrison and the rejection of claim 11 should be withdrawn.

Claims 18 and 19 depend from claim 11 and are thus nonobvious over Newley and Harrison for at least the same reasons claim 11 is nonobvious, and because each dependent claim recites a distinctly patentable combination of features.

Accordingly, applicants respectfully request that the rejections under 35 U.S.C. § 103(a) over Newley and Harrison be withdrawn. The Examiner is invited to telephone the undersigned attorney at the telephone number provided with any questions regarding this response.

Respectfully submitted,

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